



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/893,315	06/26/2001	Timothy J. Reardon	291958161US	2812
25096	7590	11/30/2005	EXAMINER	
PERKINS COIE LLP			KOCH, GEORGE R	
PATENT-SEA			ART UNIT	
P.O. BOX 1247			PAPER NUMBER	
SEATTLE, WA 98111-1247			1734	

DATE MAILED: 11/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/893,315

Applicant(s)

REARDON ET AL.

Examiner

George R. Koch III

Art Unit

1734

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) 191 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) See Continuation Sheet is/are rejected.
- 7) ☒ Claim(s) 197 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims pending in the application are 54-59,65,66,69-83,85-87,94-113,115-120,123-128,131-135,138-148,150-155,158-164,170-173,176-189,191 and 196-200.

Continuation of Disposition of Claims: Claims rejected are 54-59,65,66,69-83,85-87,94-113,115-120,123-128,131-135,138-148,150-155,158-164,170-173,176-189, 196, and 198-200.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: The first line of the specification, setting forth the parent applications, appears to be incorrect. US Patent 5,235,995 appears to be a continuation or continuation in part of applications not referenced in the first line. The first line of the specification for US Patent 5,235,995, i.e., application 07/665,942 states:

This is a continuation-in-part of copending U.S. patent application Ser. No. 07/526,052, filed May 21, 1990, entitled "Aqueous Hydrofluoric Acid Vapor Etching of Semiconductor Wafers". Ser. No. 07/526,052 was a continuation-in-part of U.S. patent application Ser. No. 07/524,239, filed May 15, 1990, entitled "Aqueous Hydrofluoric Acid Vapor Etching of Semiconductor Wafers" (now abandoned).

This is also a continuation-in-part of copending U.S. patent application Ser. No. 07/526,057, filed May 21, 1990, entitled "Aqueous Hydrofluoric and Hydrochloric Acid Vapor Processing of Semiconductor Wafers".

This is also a continuation-in-part of copending U.S. patent application Ser. No. 07/328,888, filed Mar. 27, 1989, entitled "Single Wafer Processor".

This is further a continuation-in-part of copending U.S. patent application Ser. No. 07/526,243, filed May 18, 1990, entitled "Single Wafer Processor Apparatus".

This is still further a continuation-in-part of U.S. patent application Ser. No. 07/464,101, filed Jan. 12, 1990, entitled "Low Contamination Blending and Metering Systems for Semiconductor Processing".

Priority is claimed based upon the above applications which are also hereby incorporated by reference.

With the exception of US application 07/526,243, none of the above applications are referred to in the specification. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. This application is a continuation of 09/575,965, which is a continuation of 08/883,393, which is a division of 08/422,485, which is a CIP of 07/855,767, which is a CIP of 07/665,942, which is a CIP of 07/526,243.

4. The Effective Filing date of all of the claims is April 12th, 1995 (the filing date of US application 08/422,485). Every independent claim is not supported by the specification of the previous application (US Application 07/665,942).

For example, application 07/665,942 does not support, in claim 54, the limitation of "a chemical supply adapted to supply the processing chemical to the processing bowl".

Similarly, application 07/665,942 does not support, in claim 85, the limitation of "a chemical supply adapted to supply the processing chemical to the processing bowl".

Application 07/665,942 does not support, in claim 115, the limitation of "a chemical supply adapted to supply a processing chemical to the processing bowl".

Application 07/665,942 does not support, in claim 126, the limitation of "a chemical supply adapted to supply a processing chemical to the processing bowl".

Art Unit: 1734

Application 07/665,942 does not support, in claim 150, the limitation of "the processing bowl comprising...an inner portion adapted to receive a pool of a processing chemical".

Application 07/665,942 does not support, in claim 161, the limitation of "a chemical supply adapted to supply the processing chemical to the processing bowl".

Application 07/665,942 does not support, in claim 196, the limitation of "means for supplying a processing chemical from a chemical supply to the interior of the processing bowl".

5. As a result of all claims not being supported by the entire disclosure of US Application 07/665,942, the effective filing date is all claims being April 12th, 1995. Any document prior to April 12th, 1994 would be qualify as prior art under 35 U.S.C. 102(b).

When applicant files a continuation-in-part whose claims are not supported by the parent application, the effective filing date is the filing date of the child CIP. Any prior art disclosing the invention or an obvious variant thereof having a critical reference date more than 1 year prior to the filing date of the child will bar the issuance of a patent under 35 U.S.C. 102(b). *Paperless Accounting v. Bay Area Rapid Transit System*, 804 F.2d 659, 665, 231 USPQ 649, 653 (Fed. Cir. 1986).

MPEP 2133.01.

6. Any terminal disclaimers over any reference published prior to April 12th, 1994 is not effective to overcome a rejection wherein the reference is being applied under 35 U.S.C. 102(b).

Art Unit: 1734

7. Claims 54-59, 65, 66, 69-83, 85-87, 94-113, 115-120, 123-128, 131-135, 138-148, 150-155, 158-164, 170-173, 176-189 and 196-200 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (US Patent 5,168,887, published on December 8th, 1992) in view of Ringer (US Patent 4,590,094).

As to claim 54, Thompson discloses an apparatus for processing a single wafer, comprising a framework (and a processor head mounted for movement between at least one loading position and at least one processing position (see column 2, lines 51-60), the processor head in its loading position being adapted to position a wafer outside the interior of the inner portion, the processor head carrying a rotatable wafer support (see column 6, lines 1-28) adapted to support a wafer within the interior of the inner portion when the processor head is in the processing position. Thompson also discloses a second processing chamber and a wafer transfer (item 92) adapted to move wafers to and from the first processing location and to and from the second processing chamber (see Figure 9).

Thompson does not disclose the chemical supply or the processing bowl setup.

However, Ringer discloses a similar apparatus for processing a single wafer comprising: a processing bowl (item 12), the processing bowl comprising an inner portion having an interior adapted to receive a pool of a processing chemical, an outer portion, and a fluid-receiving space between the inner portion and the outer portion; a chemical supply (items 19 and 20) adapted to supply the processing chemical to the processing bowl; a somewhat different processor head (item 10) mounted for movement between at least one loading position and at least one processing position, the

Art Unit: 1734

processor head in its loading position being adapted to position a wafer outside the interior of the inner portion (see Figure 3), the processor head carrying a rotatable wafer support adapted to support a wafer within the interior of the inner portion when the processor head is in the processing position. Ringer discloses that the chemical supply and processing bowl set-up enable a more uniform thickness in the coating of the film (column 2, lines 40-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used the chemical supply and processing bowl set-up of Ringer with the apparatus of Thompson in order to achieve uniform thickness.

As to independent claim 85, see the rejection of claim 54 above. Thompson discloses that the processor head is also in its loading position adapted to position wafers above the processing chamber, and that the wafer support is configured to overlay a single wafer and support a periphery of the single wafer with a process side of the wafer facing downward.

As to independent claim 115, see the rejection of claim 54 above. Thompson discloses having at least one loading position and one processing position as claimed (see Figure 14), the processor head in its loading position being adapted to position a wafer higher than the upper edge of the processing chamber for loading or unloading a wafer from the processor head, the processor head carrying a rotatable wafer support and a motor, the wafer support (item 10) being adapted to support a wafer below the upper edge of the processing bowl when the processor head is in its processing

Art Unit: 1734

position, the motor (item 15) being positioned above the wafer support and adapted to rotate the wafer support and any wafer held therein.

Ringer as applied above discloses the processing bowl and chemical supply as claimed.

As to claim 150, see the rejection of claim 54 and 115 (for processor head details) above. Ringer further discloses a drain (item 12b).

As to claim 161, see the rejection of claims 54 and 115 above.

As to claim 55, 117, 153, Thompson discloses the wafer support extends downwardly to a height below an upper edge of the processing bowl when the processor head is in the processing position (see Figure 14)

As to claim 56, 154 Thompson discloses that the wafer support is positioned to support wafers at a height below an upper edge of the processing bowl (figure 14).

As to claim 57, 86, 162, Ringer as incorporated further discloses a drain (item 12b).

As to claim 58, 87, 155, 163, Ringer as incorporated further discloses a fluid line as claimed (item 18).

As to claim 59, 88, 125, 164, the fluid of Ringer as incorporated from the fluid line is directed towards the drain (Figure 1).

As to claim 65, 94, 118, 158, 170, the processing head of Ringer is adapted to move vertically downwardly towards the location of the pool (item 17). Similarly,

Art Unit: 1734

Thompson discloses upward and downward movement of the processing head (column 8, lines 3-65).

As to claim 66, 95, 119, 159, 171, the processing head of Ringer as incorporated is adapted to move vertically upwardly away from the location of the pool (item 17).

Similarly, Thompson discloses upward and downward movement of the processing head (column 8, lines 3-65).

As to claim 96, and 172, Ringer as incorporated discloses a motor as claimed (item 15). Thompson also discloses a motor (motor 34 - see column 5).

As to claim 97, 120, and 173, applicant is claiming an apparatus, and the motor of Ringer or Thompson is capable of performing the spinning processes as claimed.

As to claim 69, 98, 121, and 174, applicant is claiming an apparatus, and the motor of Ringer or Thompson is capable of performing the spinning processes as claimed. Ringer discloses a start speed of 0 to 1000 rpm (see column 4, lines 10-15).

As to claim 70, 99, 122, and 175, applicant is claiming an apparatus, and the motor of Ringer or Thompson is capable of performing the spinning processes as claimed. Ringer discloses a start speed of 0 to 1000 rpm and a second rotational speed of higher than 1,000 rpm, such as 16,000 rpm (see column 4, lines 10-15).

As to claim 116, the bowl of Ringer as incorporated is capable of receiving a pool of processing chemicals. Ringer also discloses chemicals (for example, photoresist).

As to claim 124, Ringer discloses both an inner and outer portion (item 17 and 12), with the inner portion capable of holding a pool as claimed.

Art Unit: 1734

With regard to claims 75-78, 104-107, 151-152, and 180-183, official notice is taken that the use of acid resistant components and structures adapted for acid use is notoriously well known and conventional, especially in semiconductor wafer processing operations, which often use acid based materials for the processes (hydrofluoric acid, for one). One in the art would immediately recognize that acid resistant materials would improve the durability of the components. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize well known and conventional acid resistant materials in order to improve component durability.

Furthermore, as to claims 78, 107, and 183, Ringer as incorporated discloses a drain line (item 12b).

With regard to claims 79-83, 108-113, 160, and 184-189, official notice is taken that the use of such routine structures such a heat sources, platforms that can be raised, wafer support stands, and heat dissipaters is notoriously well known and conventional in wet processing semiconductor operations. One in the art would immediately appreciate that these structures speed up the drying time for wafer, improving throughput. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such well known and conventional structures in order to improve processing throughput.

As to claim 126, Thompson discloses annular recesses as claimed (item 78, called an annular trough). Thompson discloses that these recesses serve to collect

Art Unit: 1734

excess spray liquid (see column 6, line 63 to column 7, line 9). One in the art would appreciate that such recesses prevent damage to the substrate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize such a recess in order to reduce damage to the substrate.

As to claim 127, both Thomspen (item 34) and Ringer discloses a motor as claimed (item 15).

As to claims 128, applicant is claiming an apparatus, and the motors of Thompson or Ringer is capable of performing the spinning processes as claimed.

As to claims 131 and 132, the wafer support of both Thomspen (see Figure 14) and Ringer extends as claimed (see Figure 3).

As to claim 133, Ringer as incorporated discloses a fluid line and drain line as claimed (items 18 and 12b).

As to claim 134, Ringer as incorporated discloses both an inner and outer portion (item 17 and 12), with the inner portion capable of holding a pool as claimed.

As to claim 135, Ringer as incorporated discloses a drain in the location claimed (item 12b) such that it can function as claimed.

As to claim 138 and 139, both Thompson and Ringer discloses that the processor head can move as claimed.

As to claim 196, see the rejections of claims 54 and 115 under Thompson Ringer above, which disclose the processor head, the processing bowl, the means for positioning a processor head, the means for lowering the processor head, the means for

Art Unit: 1734

supplying processing chemicals, the means for lifting the processor head, means for engaging the wafer transfer, and means for transferring the wafer.

Additionally, Thompson discloses that the processor head extends outwardly of the periphery of the wafer (see figures).

As to claims 71, 100, 123 and 176, Thompson discloses annular recesses as claimed (item 78, called an annular trough). Thompson discloses that these recesses serve to collect excess spray liquid (see column 7, lines 1-6). One in the art would appreciate that such recesses prevent damage to the substrate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize such a recess in order to reduce damage to the substrate.

As to claims 72, 101, and 177, Thompson (items 125 and 40, respectively) disclose wafer supports with a wafer support plate, and that the wafer support plate further has a downwardly directed front face and an upwardly directed back face. One in the art would appreciate that the faces "grip" the substrate and prevent the wafer from dislodging during spinning, thus improving coating.

As to claim 73, 102, and 178, the faces Thompson function as a plurality of fingers.

As to claim 74, 103, and 179, Thompson peripherally support the wafer.

With regard to claims 140-143 official notice is taken that the use of acid resistant components and structures adapted for acid use is notoriously well known and conventional, especially in semiconductor wafer processing operations, which often use acid based materials for the processes (hydrofluoric acid, for one). One in the art would immediately recognize that acid resistant materials would improve the durability of the components. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize well known and conventional acid resistant materials in order to improve component durability. Furthermore, as to claim 143, Ringer discloses a drain line (item 12b).

With regard to claims 136-137, official notice is taken that the use of recirculation systems, heater controls, heat exchangers and the like is notoriously well known and conventional, especially in semiconductor wafer processing operations. One in the art would appreciate that semiconductor processing materials and solutions are extremely expensive and require specific operating conditions, and the a recirculation system with temperature controls would prevent the waste of the materials and ensure their usability in future processes. Therefore, it would have been well known and conventional to one of ordinary skill in the art at the time of the invention to have utilized such recirculation system in order to reduce the cost of semiconductor processing.

With regard to claims 144-148, official notice is taken that the use of such routine structures such a heat source, platforms that can be raised, wafer support stands, and

Art Unit: 1734

heat dissipaters is notoriously well known and conventional in wet processing semiconductor operations. One in the art would immediately appreciate that these structures speed up the drying time for wafer, improving throughput. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such well known and conventional structures in order to improve processing throughput.

As to claim 198, Thompson disclose that the processor head further comprises a wafer plate (item 30) that overlays the wafer and a circular shroud (motor base 15) over the motor.

As to claim 199, Thompson discloses gripping fingers (item 40) arranged to engage the periphery of the wafer and actuator means (pivot shaft 47, radial linkage bar 45, torsion spring 53, etc) to pivotally move the gripping fingers to engage/disengage the periphery of the wafer.

As to claim 200, Thompson discloses flexible support diaphragms (item 42).

Allowable Subject Matter

8. Claim 197 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record does not suggest all of the elements of claim 197 in

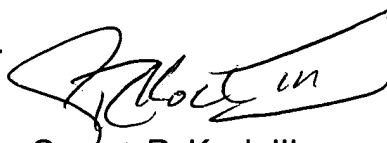
Art Unit: 1734

combination with the other elements of claim 115. All of the elements of claim 115 are disclosed and made obvious by Thompson (US 6,168,887) and Ringer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George R. Koch III whose telephone number is (571) 272-1230 (TDD only). If the applicant cannot make a direct TDD-to-TDD call, the applicant can communicate by calling the Federal Relay Service at 1-866-377-8642 and giving the operator the above TDD number. The examiner can normally be reached on M-Th 10-7.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



George R. Koch III
Primary Examiner
Art Unit 1734

Application/Control Number: 09/893,315
Art Unit: 1734

Page 15

GRK
11/27/2005